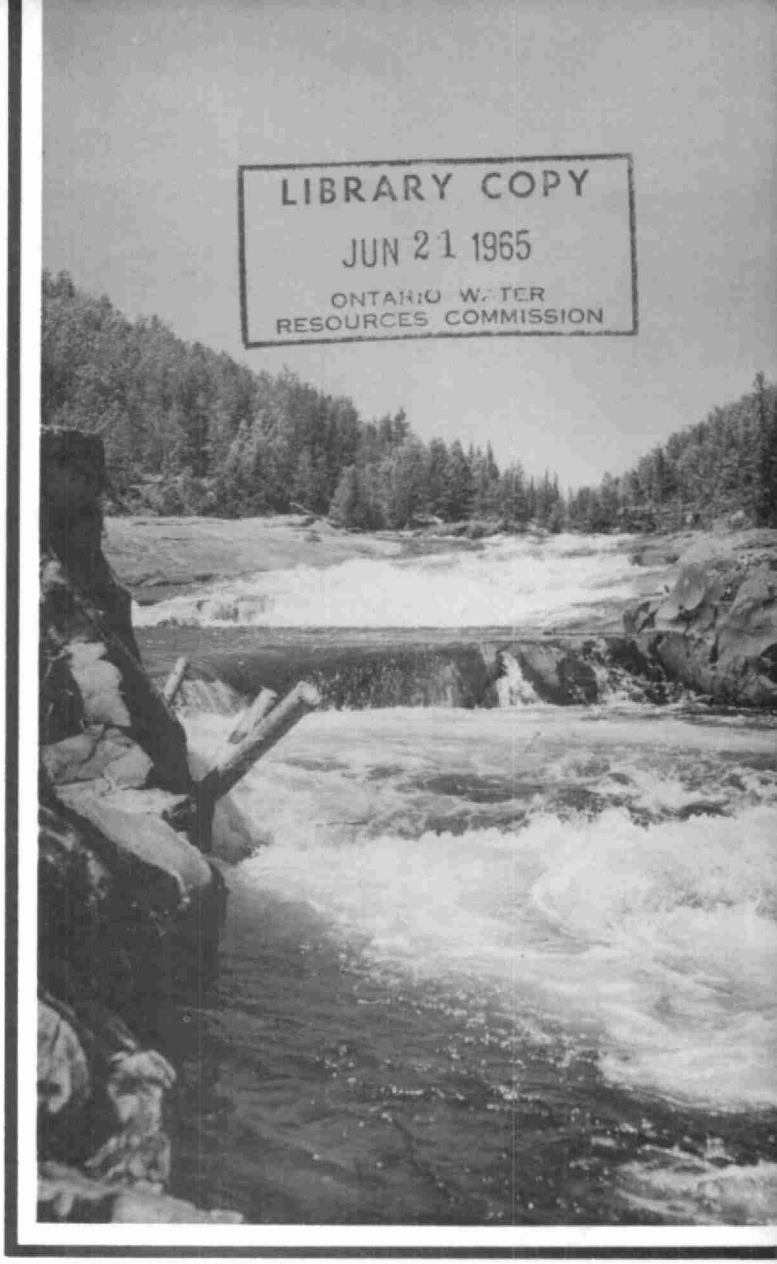
Sault Ste Marie Water Pollution Control Plant



1963 Annual Report

Ontario Water Resources Commission

ONTARIO WATER RESOURCES COMMISSION

OFFICE OF THE GENERAL MANAGER

Members of Sault Ste. Marie
Water Pollution Control Plant,
Local Advisory Committee.

Gentlemen:

I am pleased to submit, for your information, the 1963 Annual Operating Report of the Sault Ste. Marie Water Pollution Control Plant, OWRC Project No. 58-S-20, which has been prepared by our Division of Plant Operations.

We are grateful for the kind cooperation which you and your staff have extended to our Operations staff throughout the year. We look forward to a continuing close association with you in our mutual endeavour to control pollution.

Yours very truly,

D. S. Caverly,
General Manager

General Manager,
Ontario Water Resources Commission.

Dear Sir:

It is with pleasure that I present to you the Annual Report of the operation of the Sault Ste. Marie Water Pollution Control Plant, OWRC Project No. 58-S-20 for 1963.

This report presents design data, outlines operating problems encountered and summarizes in tables, charts and graphs all significant flow and cost data.

Yours very truly,

B. C. Palmer,
Director,
Division of Plant Operations

foreword

This report is designed to present the highlights of the operation of these works during 1963. Trends in flows and other operating data can be extremely useful in the development of necessary long range enlargement and improvement programs.

In addition to the activities reported herein, much unrecorded effort has contributed to the success of this operation. The municipalities, through representatives on the Local Advisory Committee, have given valuable assistance in reviewing salary schedules, detailed operating budgets, personnel problems, flow patterns, and major maintenance problems.

The Division of Plant Operations has provided direction to the field staff in administrative procedures, quality control, maintenance schedules, equipment inspection and purchase supervision. A number of other Divisions of the Commission have been of service. The Division of Construction has offered helpful advice on equipment selection and renovation problems. The Division of Sanitary Engineering has maintained, through its District Engineering staff, a keen interest in the operation and has made a number of constructive recommendations. Its operator training courses have been very helpful. The Division of Finance has processed many payrolls, purchase orders and invoices dealing directly with this project. The Commission Personnel Director has been most helpful in the selection of new staff.

The excellent cooperation of all of these groups is gratefully acknowledged.

B. C. Palmer,
Director,
Division of Plant Operations

ONTARIO WATER RESOURCES COMMISSION

DIVISION OF PLANT OPERATIONS

contents

Mr. C. W. Perry
Assistant Director
Mr. D. McTavish
Regional Supervisor
Mr. M. Fielding
Operations Engineer

SAULT STE MARIE WATER POLLUTION CONTROL PLANT

OPERATED FOR

THE CITY OF SAULT STE. MARIE,
THE TOWNSHIP OF KORAH
AND
THE TOWNSHIP OF TARENTOROUS

BY

THE ONTARIO WATER RESOURCES COMMISSION

CHAIRMAN

A. M. Snider

COMMISSIONERS

W. D. Conklin, Q. C.
J. H. H. Root, M. P. P.
J. A. Vance, LL. D., P. Eng.
A. A. Wishart, Q. C., M. P. P.

GENERAL MANAGER

D. S. Caverly

ASSISTANT GENERAL MANAGERS

G. M. Galimbert
L. E. Owers

COMMISSION SECRETARY

W. S. MacDonnell

1952 to 1963 History

In 1952, the City of Sault Ste. Marie and the Townships of Korah and Tarentorus jointly decided to select a consultant to submit a report dealing with an interceptor sewer system, which would collect sewage from all three municipalities and dispose of it at a central location.

This original report on the Integrated Sewage Works was submitted in November 1953 by Proctor and Redfern, Consulting Engineers. The recommendations contained were adopted by the municipalities and they proceeded with the first stage of the four stage program. This first stage, consisting of a sanitary interceptor running east from Goulais Avenue to John Street, was completed in 1955 at a cost of approximately $437,000.

By the spring of 1958, the three municipalities had completed negotiations with the OWRC for the three remaining stages of the integrated system. The Ontario Municipal Board gave its conditional approval in June 1958.

Tenders were called on the second stage of construction in November 1958. This stage included all sewers and force mains between John Street and the site of the present sewage treatment plant. Previously tenders had been called on part of this stage, the section between John Street and Pim Street. However, due to the lack of contractor interest and high unit prices, it was decided to re-tender, this time including all the proposed trunk sewers and force mains under one specification in two parts, Contracts A and B. Keystone Construction Ltd. of Windsor was awarded Contract A at $709,925.51, and Beaver Construction Company Limited of Montreal was awarded Contract B at $652,249.00. These were the lowest of a total of seven bidders.

Both of the second stage contracts were completed in March 1961 at a total cost of $1,301,117.51, not including engineering fees, etc.

Tenders were received on May 20, 1960 for both the third and fourth stages of the integrated system.

The third stage was divided into two contracts, C and D. Contract C was for the construction of the Pim Street Pumping Station and Contract D was for the construction of the Clark Creek Pumping Station. L. R. Brown Company Ltd. of Sault Ste. Marie, which was the lowest of five bidders, was awarded both contracts at $468,534.00. This stage was completed in October 1961 at a cost of $459,691.42. In addition, approximately $67,707.00 was spent on equipment and $34,856.00 for engineering fees, etc.

The fourth stage, which consisted of the primary treatment plant and the outfall sewer, was awarded to Matthews Concrete Limited of London at $825,873.00, the lowest of seven bids. This contract was completed on February 8, 1962 at a cost of $801,334.74. The additional costs of this stage include an equipment cost of approximately $240,294.00 and $76,756.00 for engineering fees, etc.

The integrated system commenced operation as a complete unit on February 9, 1962 and was officially opened on June 6, 1962 by Mr. A. M. Snider, Chairman of the OWRC, Mayor J. L. McIntyre of Sault Ste. Marie, Reeve D. W. Murray of Tarentorus Township and Reeve J. A. Allen of Korah Township.

Project Staff

Mr. George Buckley
Superintendent

Plant Mechanic	-	Mr. J. Horsburg
Filter Operator	-	Mr. C. W. Hayes
Shift Operators	-	Mr. R. Burns
	-	Mr. J. Dobson
	-	Mr. H. Foster
	-	Mr. R. Nicholson
	-	Mr. R. McKenley
	-	Mr. H. Blume
Groundskeeper	-	Mr. J. Bray

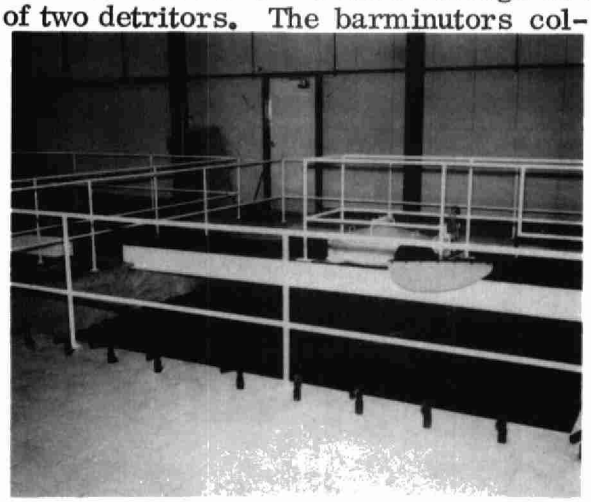
The sewage treatment plant, supervised for 16 hours per day, is well maintained and kept in good condition both as to appearance and mechanical elements. Mr. Buckley and his staff are to be commended for their efforts.

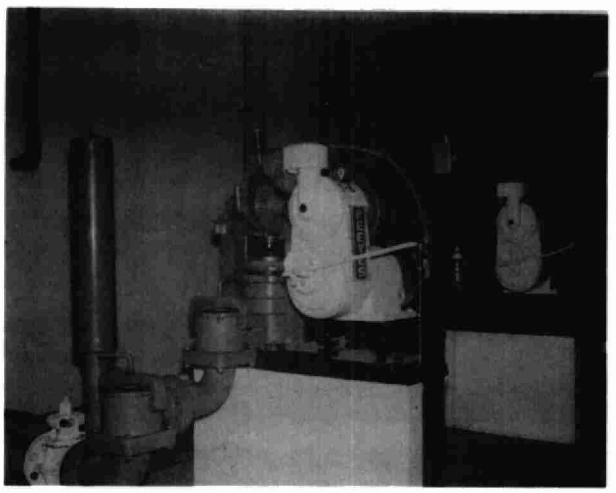
Description of Project

INFLUENT WORKS

Influent to the plant is metered in a Parshall flume before undergoing any treatment. At times when the flow exceeds the capacities of the treatment units, the excess can be by-passed over a fixed weir. This by-pass flow is coarse screened to remove large solids.

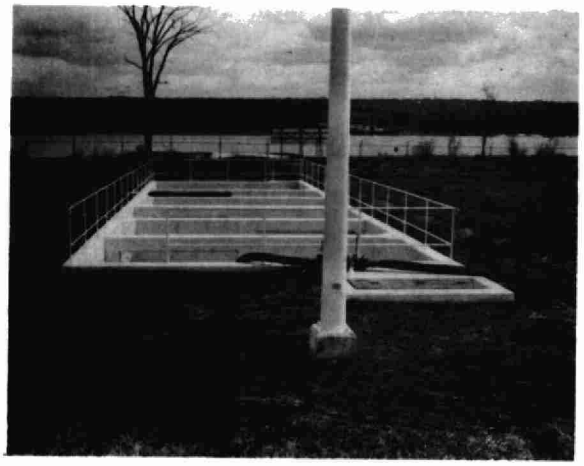
The first processes in the treatment process take place in the detritor building where the flow passes through one of two barminutors and thence through one of two detritors. The barminutors collect and cut up the larger particles then return the shreddings to the flow. The detritors reduce the velocity of the flow allowing grit, sand, gravel and silty material to settle out. A revolving collector mechanism at the bottom of the detritor draws the settled material to a sump from which a reciprocating rake lifts the material to a gantry bucket for disposal. The rake channel is equipped with two organic return pumps which return the suspended organic material back to the flow.





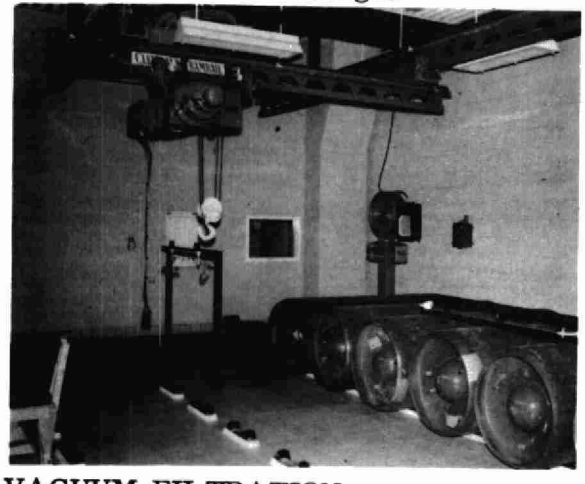
PRIMARY SEDIMENTATION TANK

From the detritor the flow is discharged via a distribution chamber to the four primary sedimentation tanks. Here the flow is detained to allow the heavier solids to settle to the bottom of the tank. The settled solids, or sludge, is removed by revolving mechanical scrapers and is pumped to a holding tank for further processing. The scum which collects on the surface of the settling tanks is removed by skimmer mechanisms and after dewatering is also pumped to the sludge holding tanks.



CHLORINE CONTACT CHAMBER

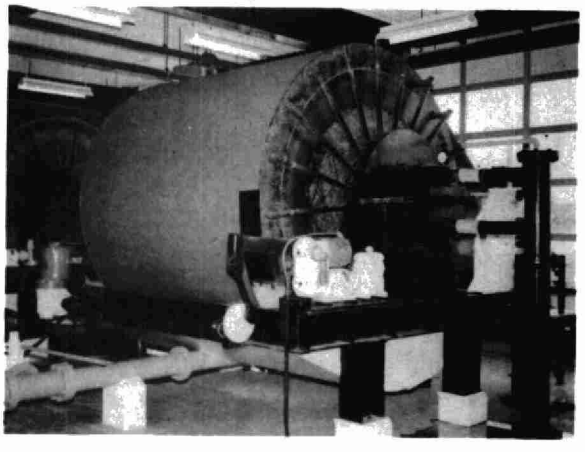
The effluent from the primary tanks flows by gravity to the chlorine contact chamber. Chlorine is added at this point and following a short detention period in the chamber, the effluent is discharged via a 54" outfall sewer to the St. Marys River. All by-pass flow passes through the chlorine contact chamber and is usually subjected to an increased chlorine dosage.



VACUUM FILTRATION

The raw sludge collected by the primary settling tanks is dewatered by one of two vacuum filters. To operate these units efficiently, they must have a sufficient supply of sludge to run continuously for several hours. Since it is not practical to allow enough sludge to build up in the primary tanks to permit this continuous operation, sludge holding tanks have been employed to retain sludge. These holding tanks are aerated to prevent the raw sludge from becoming septic during its detention period prior to filtration.

Immediately before filtering, the raw sludge is pre-conditioned with coagulants, lime and ferric chloride, which assist in compacting the sludge on the filter surface. The dewatered sludge or filter cake is discharged to a conveyor which transports it to a skiphoist. The skip raises the filter cake to a hopper for storage until it can be hauled by truck to a disposal site.



Design–Data

GENERAL

Type of Plant - Primary treatment.

Design Population - 72,500 persons.

Design Plant Flow - 8 million gallons per day.

Per Capita Flow - 110 Imperial gallons per day.

Five Day BOD -

Raw Sewage	-	250 PPM
Removal	-	35%

Suspended Solids -

Raw Sewage	-	200 PPM
Removal	-	60%

Pim Street Pumping Station

Pumps -

One Worthington 10,000 GPM at 50 ft. TDH driven by a 165 HP Dorman diesel engine.

Two Worthington each 6,300 GPM at 40 ft. TDH driven by a Brooks 75 HP electric motor.

Control -

A General Services Company Flomatcher variable speed controller coupled to a bubbler system.

Clark Creek Pumping Station

Pumps -

One Worthington 15,400 GPM at 40 ft. TDH driven by a 217 HP Dorman diesel engine.

Two Worthington each 8,400 GPM at 28 ft. TDH driven by a Brooks 75 HP electric motor.

Control -

A General Services Company Flomatcher variable speed controller coupled to a bubbler system.

PRIMARY TREATMENT PLANT

Influent Sewer

Thirty-six inch diameter force main.

Metering

Parshall flume - length 14 ft. 11 in., throat 4 ft.

Screening

Two Chicago Pump Company 36 inch Model C barminutors.

Coarse bar screen in each by-pass channel.

Grit Removal

Two Dorr-Oliver-Long 18 ft. diameter detritors complete with collecting mechanisms.

Grit Removal - Continued

Volume - 6,240 Imperial gallons.

Detention time - 1.13 minutes.

Velocity - 0.209 feet per second.

Primary Sedimentation Tanks

Four Dorr-Oliver-Long 70 ft. diameter "Squarex" clarifiers complete with scum and sludge removal mechanisms.

Volume of each - 36,000 cubic feet or 225,000 Imperial gallons.

Detention time - 2.3 hours at 8 ft. depth.

Surface Settling Rate - 520 Imperial gallons per sq. ft. per day.

Weir Overflow Rate - 13,000 Imperial gallons per lineal foot per day.

Chlorine Contact Chamber

One Wallace and Tiernan V-notch gas chlorinator. Maximum dosage of 800 lbs. per day.

A Cleveland Tramrail Hoist is used to handle the one-ton chlorine cylinders.

A Fairbanks-Morse 9,000 pound scale is used to weigh the one ton cylinders.

Aerated Sludge Holding Tank

Two rectangular tanks 24' x 15' x 11.5'.

Volume of each tank - 4,140 cubic feet or 25,800 gallons.

One Sutorbilt 8 HVB blower, driven by a 2.5 HP General Electric induction motor.

Raw Sludge Vacuum Filtration

Two Komline-Sanderson filters, each complete with conditioning tanks and agitators and driven by a Reeves Varispeed motor.

One Crofts-Bradford gear driven conveyor powered by a Brooks 2 HP electric motor.

One Webster-Smallwood skip hoist powered by a BEPCO 5 HP motor.

Pumps

Four Marlow Plunger Type raw sludge pumps each powered by a 2 HP Leland-Newman motor.

Two Komline-Sanderson Plunger Type sludge pumps rated at 60 GPM and each powered by a 1 1/2 HP C. G. E. induction motor.

Two Komline-Sanderson diaphragm type lime pumps rated at 20 GPM and each powered by a 1/4 HP Reeves motor.

Two Komline-Sanderson diaphragm type ferric chloride pumps rated at 20 GPM and each powered by a 1/4 HP Reeves motor.

Two Aurora condensate pumps rated at 75 GPM and each powered by a Bull-E.R. & F. Turner Ltd. 2 HP motor.

Two Nash Hytor vacuum pumps each powered by a 30 HP British Thomson-Houston Company motor.

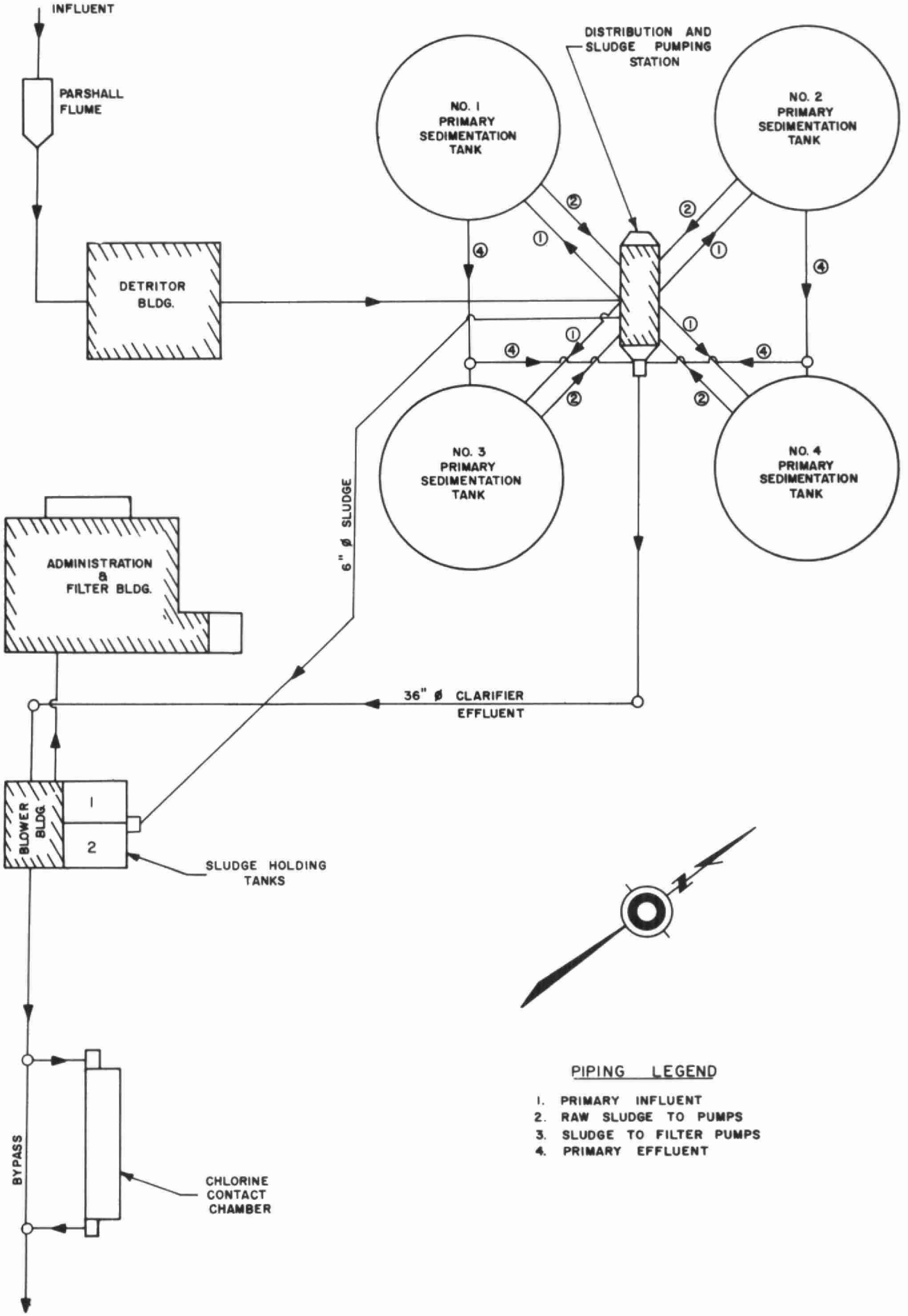
Two Dorr-Oliver-Long organic return pumps each powered by a 1/2 HP Westinghouse motor.

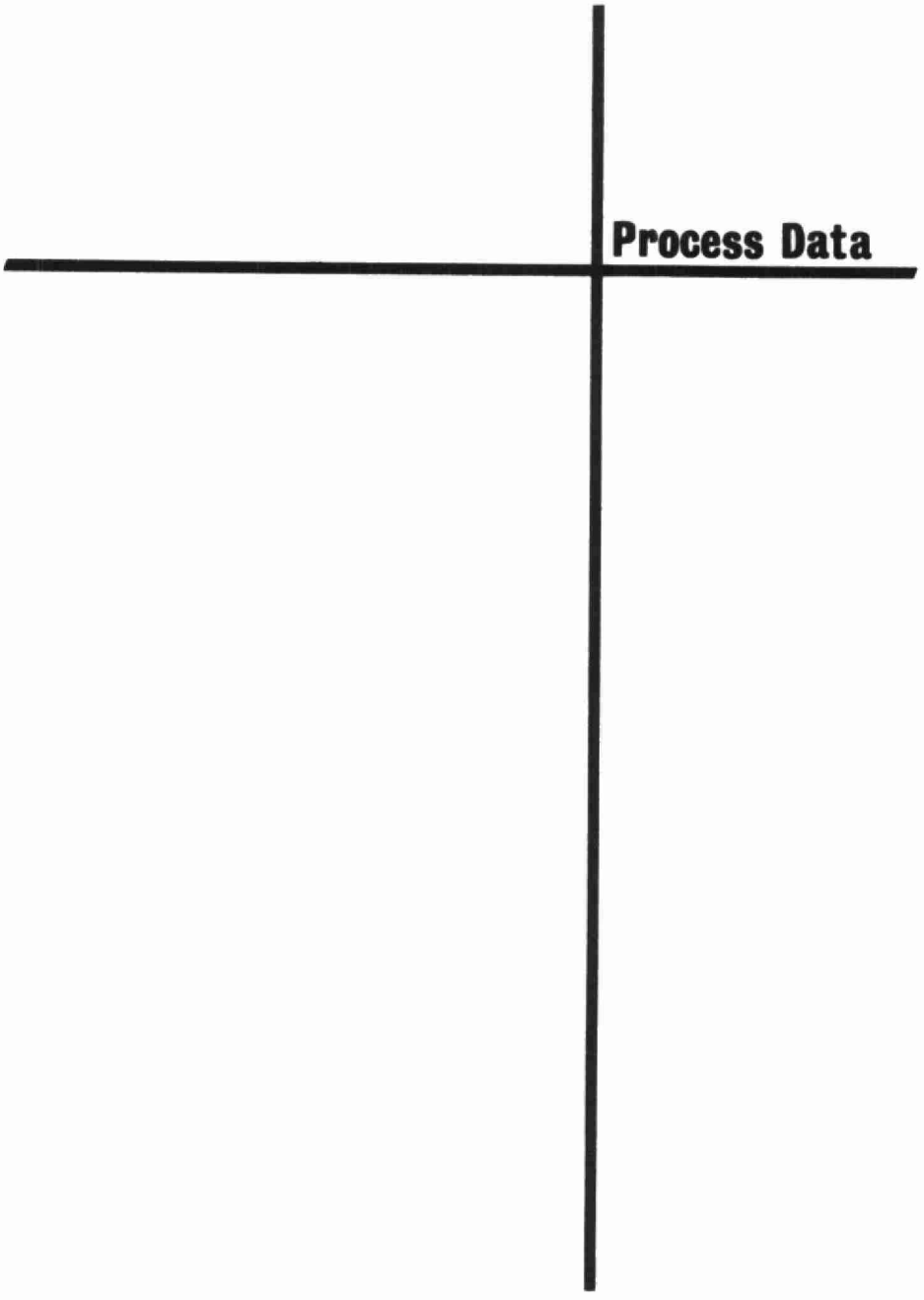
Two Smart-Turner sump pumps each powered by a 5 HP C. G. E. motor.

SAULT STE. MARIE

WATER POLLUTION CONTROL PLANT

FLOW DIAGRAM

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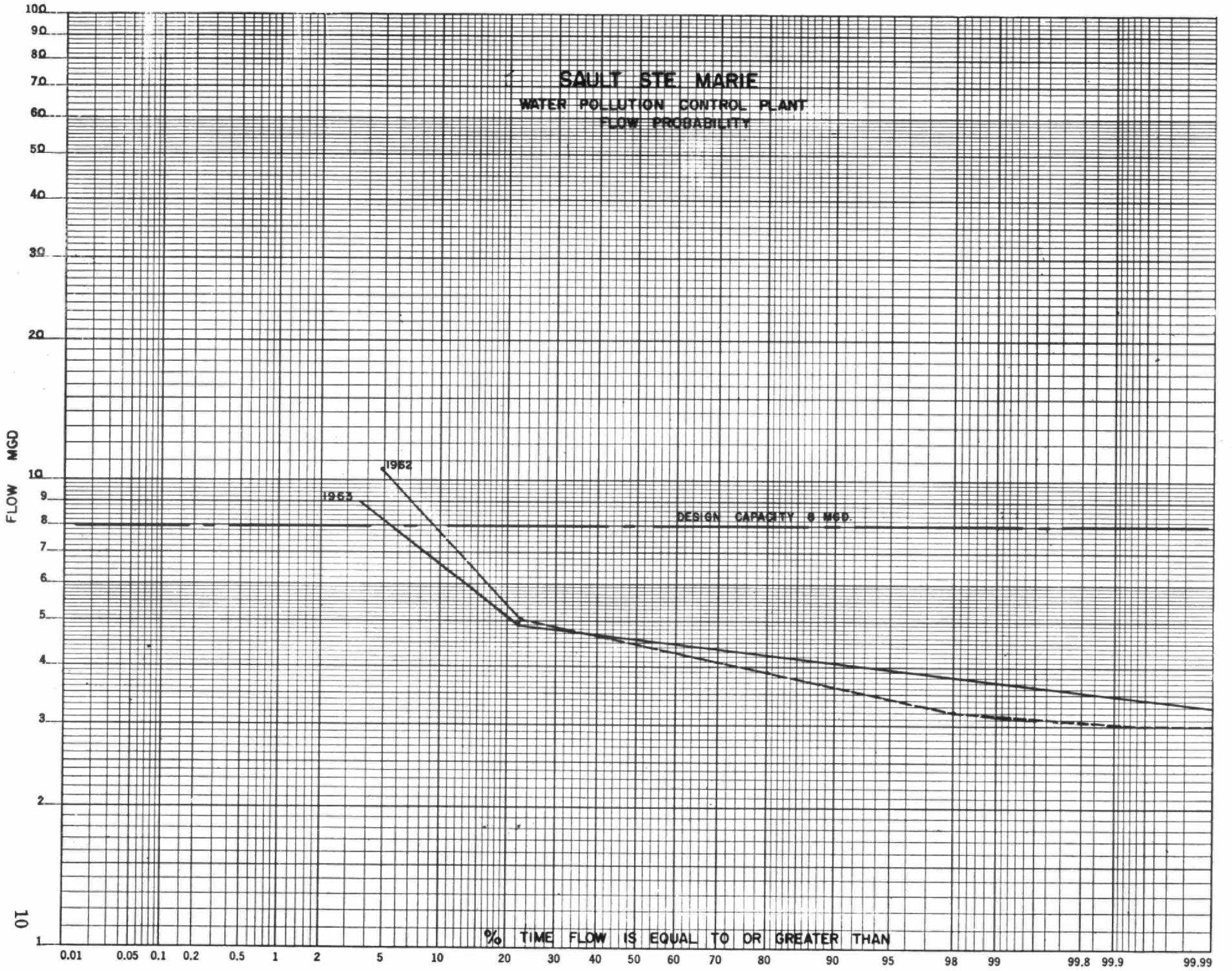
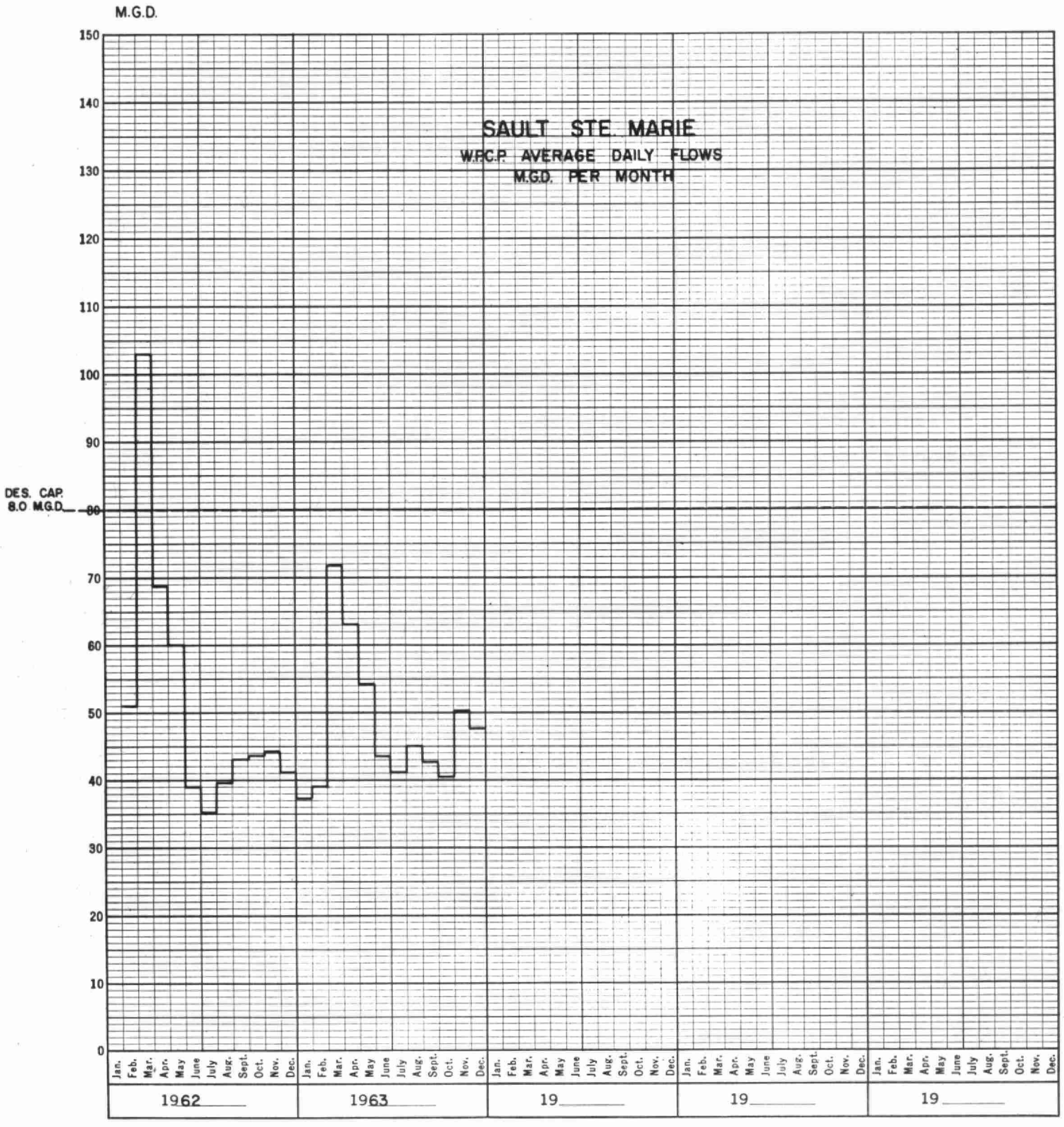
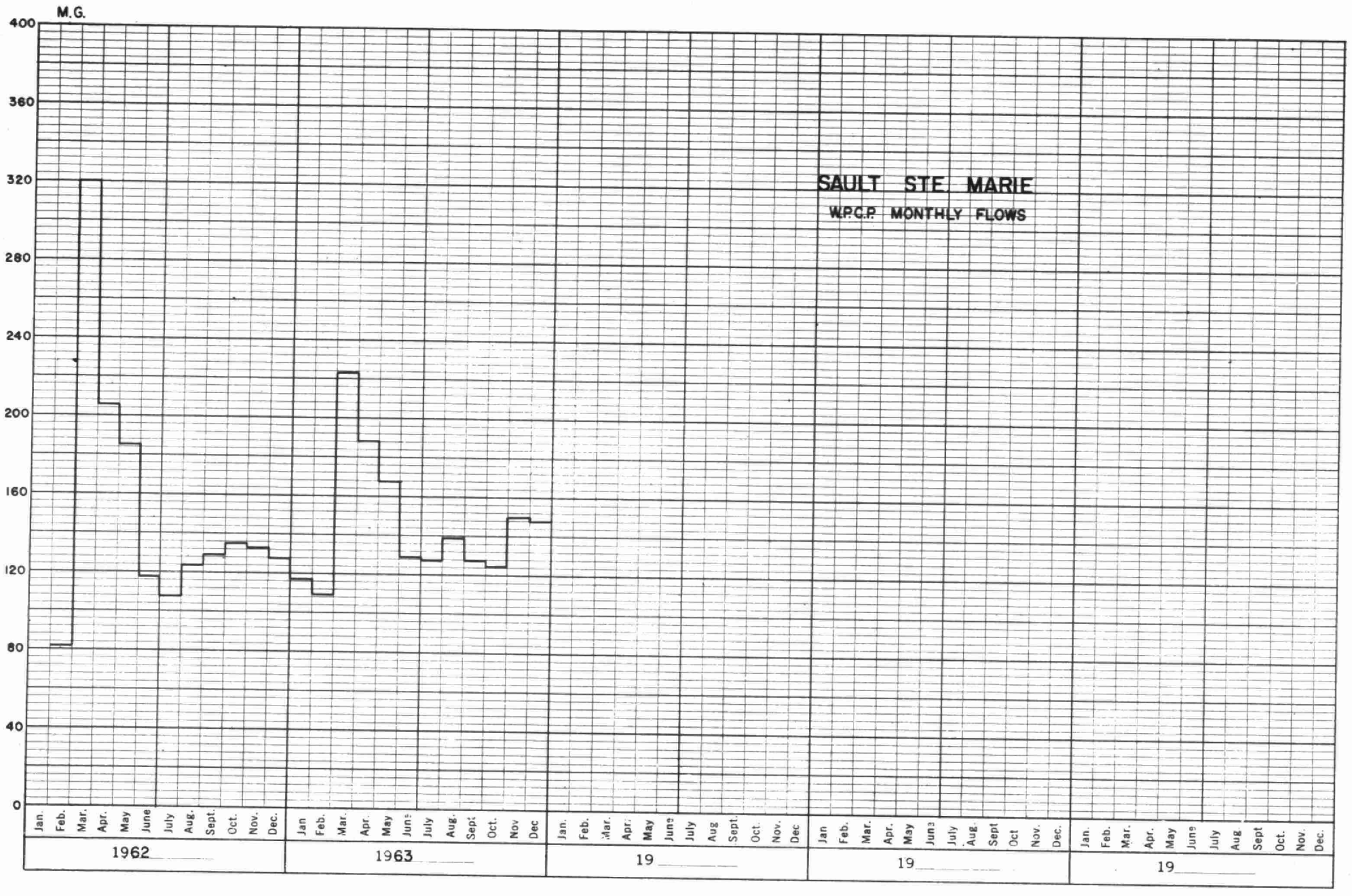
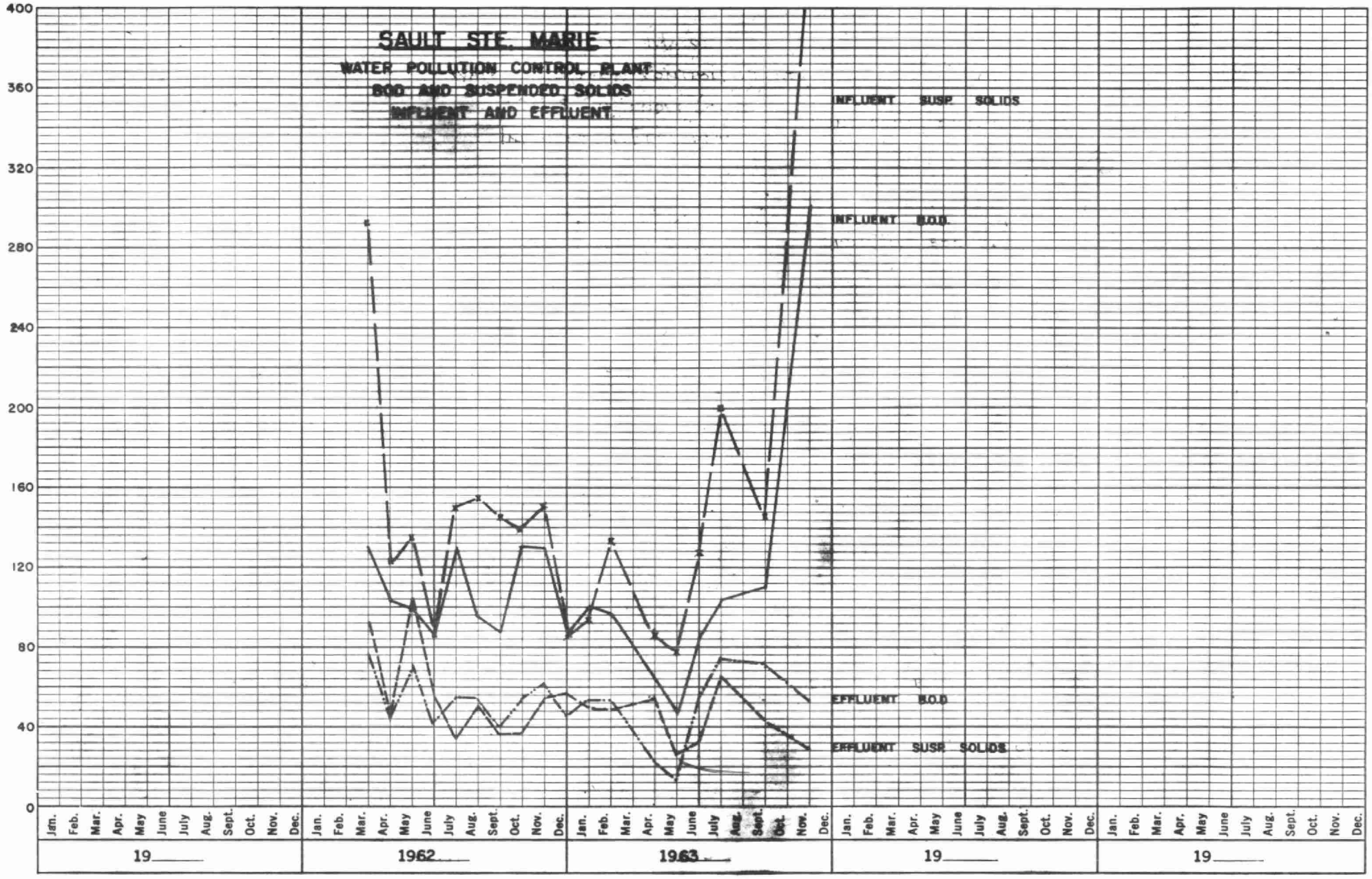

SAULT STE. MARIE
WATER POLLUTION CONTROL PLANT
FLOW PROBABILITY
FLOW MGD
100
90
80
70
60
50
40
30
20
10
9
8
7
6
5
4
3
2
1
1952
1963
DESIGN CAPACITY 8 MGD.
% TIME FLOW IS EQUAL TO OR GREATER THAN
0.01
0.05
0.1
0.2
0.5
1
2
5
10
20
30
40
50
60
70
80
90
95
98
99
99.8
99.9
99.99


M.G.D.
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
DES. CAP.
8.0 M.G.D.
SAULT STE. MARIE
W.P.C.P. AVERAGE DAILY FLOWS
M.G.D. PER MONTH
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
1962
1963
19
19
19


M.G.
400
360
320
280
240
200
160
120
80
40
0
SAULT STE. MARIE
W.P.C.P. MONTHLY FLOWS
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
1962
Jan Feb. Mar. Apr. May Jun: July Aug. Sept. Oct. Nov Dec
1963
Jan. Feb. Mar. Apr. May Jun: July Aug Sept. Oct. Nov. Dec
19
Jan Feb. Mar. Apr. May Jun: July Aug. Sept Oct Nov. Dec.
19
Jan. Feb. Mar. Apr. May Jun: July Aug Sept Oct. Nov. Dec.
19


SAULT STE. MARIE
WATER POLLUTION CONTROL PLANT
BOD AND SUSPENDED SOLIDS
INFLUENT AND EFFLUENT
INFLUENT SUSP SOLIDS
INFLUENT B.O.D.
EFFLUENT B.O.D.
EFFLUENT SUSP SOLIDS
400
360
320
280
240
200
160
120
80
40
0
Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
19____
1962
1963
19____
19____

GRIT, B.O.D AND S.S. REMOVAL

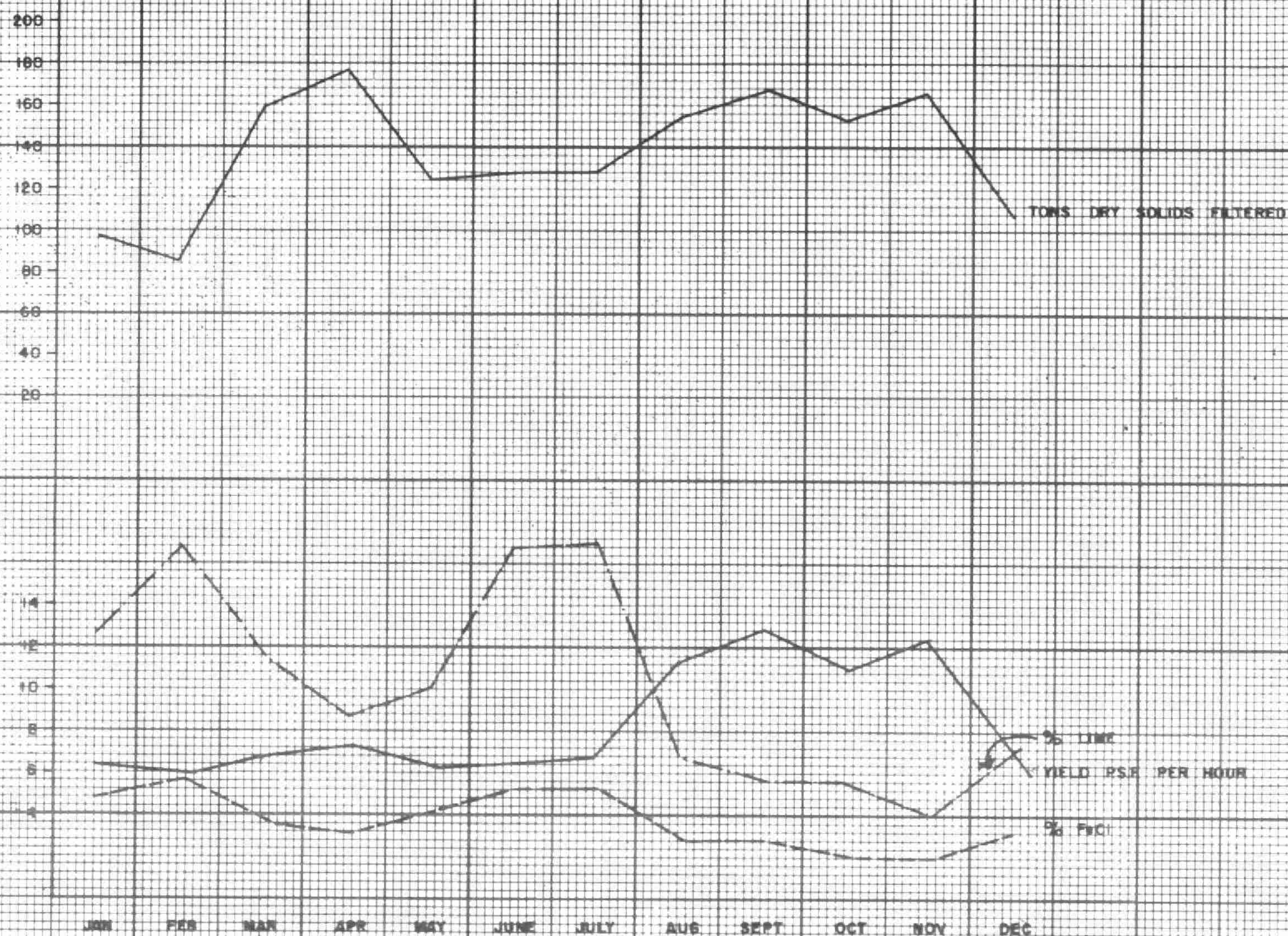
MONTH	B.O.D.				S.S.				GRIT REMOVAL CU. FT.
	INFLUENT PPM	EFFLUENT PPM	% REDUCT	TONS REMOVED	INFLUENT PPM	EFFL. PPM	% REDUCT	TONS REMOVED	
JANUARY	100	53	47	28	92	51	45	25	275
FEBRUARY	96	54	44	23	133	49	63	46	155
MARCH									231
APRIL	64	24	63	38	83	56	33	26	593
MAY	46	15	68	26	78	26	67	44	341
JUNE	84	54	36	20	127	34	73	61	264
JULY	104	75	28	18	200	65	68	87	296
AUGUST									245
SEPTEMBER	115	72	38	28	145	42	71	66	244
OCTOBER									252
NOVEMBER	290	53	82	18	445	29	94	31	576
DECEMBER									102
TOTAL									3574
AVERAGE	113	50	56	25	163	44	73	48	298

COMMENTS

During 1963, the incoming sewage contained an average of 113 PPM BOD and 163 PPM suspended solids. This is consistent with average domestic sewage characteristics. It is noted, however, that the strength of the sewage increased during the latter part of the year. Analysis records in 1964 will be examined to determine if this is an isolated instance, or if a trend is evident. The plant had an average removal efficiency of 56% and 73% for BOD and suspended solids respectively. This is considered extremely effective treatment for a primary treatment process.

SAULT STE. MARIE

WATER POLLUTION CONTROL PLANT
VACUUM FILTER RESULTS 1963



VACUUM FILTER OPERATION

MONTH	FILTER HOURS.		% SOLIDS RAW SLUDGE	TONS DRY SOLIDS	TONS LIME	% LIME	TON $FECL_3$	% $FECL_3$	% SOLIDS FILTERED SLUDGE	YIELD P.S.F./ HR.
	# 1	# 2								
JAN	80	77	4.0	96	8.9	12.7	2.27	4.7	23.3	6.1
FEB	76	76	3.6	85	10.3	16.8	2.32	5.7	22.7	5.9
MAR	122	122	4.8	158.7	11.7	11.5	2.63	3.7	26.4	6.6
APR	128	128	5.1	176.5	9.0	8.7	2.29	3.0	27.4	7.2
MAY	99	99	4.0	124	9.3	10.0	2.45	4.0	25.9	6.2
JUNE	101	101	4.4	126	13.7	16.6	3.01	5.0	26.0	6.1
JULY	95	95	4.6	126	14.5	16.9	3.65	5 .2	25.5	6.7
AUG	84	48	6.5	153	8.5	6.5	2.59	2.8	23.0	7.2
SEPT	87	48	7.5	166	8.2	5.5	2.57	2.6	24.5	12.7
OCT	124	23	6.1	152	9.5	5.3	2.54	1.9	24.9	10.8
NOV	136	-	7.6	164	11.3	3.8	2.86	1.9	25.0	12.1
DEC	156	-	4.0	108	10.8	6.9	3.00	3.1	18.3	7.1
TOTAL	1288	817		1635.2	125.7		32.3			
AVERAGE	107	68	5.2	136	10.5	10.1	2.69	3.6	24.4	8.2

COMMENTS

The vacuum filter operation was complicated during 1963 by a failure of the drive mechanism on the No. 2 filter, thus throwing an increased load onto filter No. 1. The solids content of the raw sludge varied from 3.6% to 7.6% with an average of 5.2%. The use of an average of 10.1% lime and 3.6% $FeCl_3$ gave a filtered sludge containing 24.4% solids. The average yield of 8.2 pounds of solids per square foot of filter area per hour of operation is indicative of good operation.

CHLORINATION

MONTH	PLANT FLOW (M.G.D.)	POUNDS CHLORINE/DAY	DOSAGE RATE (P.P.M.)
JANUARY	3.86	--	--
FEBRUARY	3.93	--	--
MARCH	7.20	--	--
APRIL	6.33	--	--
MAY	5.45	285	5.2
JUNE	4.36	278	6.4
JULY	4.14	256	6.1
AUGUST	4.52	267	5.9
SEPTEMBER	4.29	250	5.8
OCTOBER	4.06	270	6.65
NOVEMBER	5.02	249	4.9
DECEMBER	4.79	266	5.5
TOTAL			
AVERAGE	4.83	265	5.4

COMMENTS

Chlorination, for purposes of effluent disinfection, is carried on from break-up to freeze-up in the receiving stream. Chlorine application is effected by automatic proportioning equipment supplied from one ton cylinders.

1963

PLANT — **Total Operating Costs** — **MONTHLY**

MONTH	TOTAL EXPENDITURE	PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICAL	GENERAL SUPPLIES	EQUIPMENT	REPAIRS & MAINTENANCE	SUNDRY *	WATER
JAN	$ 5,134	$ 3,513	$ 72	$ 35	$	$ 573	$ 133	$	$ 26	$ 782	$
FEB	15,143	3,590		1,013	2,475	1,386	163	1,013	648	4,772	
MARCH	6,937	3,526		398	456	470	81	741	140	1,073	52
APRIL	7,893	3,631		648	1,564	103	111		443	1,317	76
MAY	7,537	3,560			1,939	(526)	188		648	1,605	122
JUNE	6,302	3,570		271	717	(273)	296	283	287	1,064	87
JULY	16,421	5,492			819	5,693	348	40	548	3,343	137
AUG	4,850	3,712			1,549	(1,110)	130	27	139	231	174
SEPT	9,915	3,749			1,508	2,011	193	16	225	2,072	140
OCT	7,654	3,749			623	1,784	244		308	858	88
NOV	6,008	3,731		278			263	70	513	1,013	140
DEC	13,741	5,376			1,472	3,222	183	15	458	2,053	310
TOTAL	$ 107,538	$ 47,201	$ 72	$2,643	$ 13,772	$ 13,336	$ 2,333	$ 2,206	$ 4,380	$ 20,185	$1,409

* INCLUDES COST OF SLUDGE HAULAGE

PLANT — **YEARLY**

YEAR	M.G. TREATED	TOTAL COST	COST PER MILLION GALLONS	COST PER CAPITA PER YEAR
1961				
1962 **	1601.26	$ 96,491.83	$57.30	$1.61
1963	1764.94	$107,538.08	$61.00	$1.73

** PLANT STARTED UP FEBRUARY, 1962

VACUUM FILTER COSTS MONTHLY

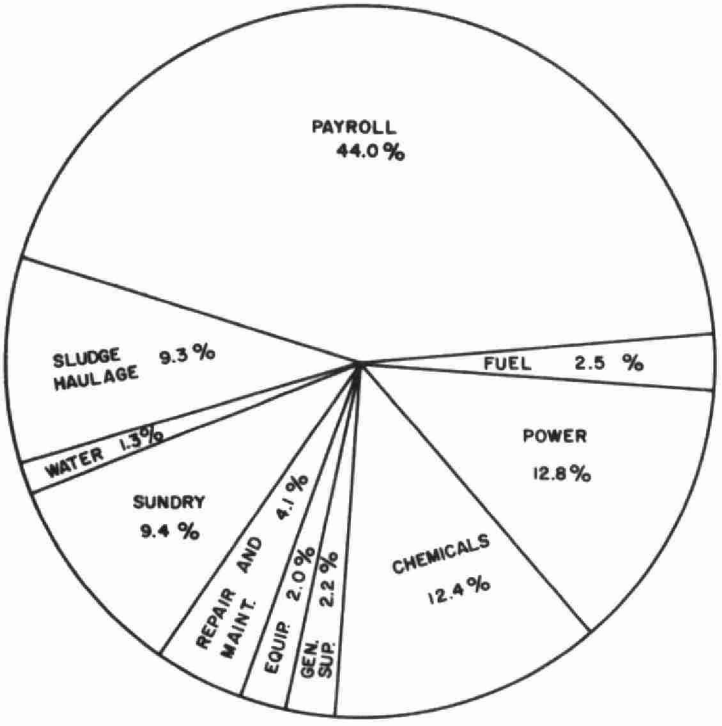
MONTH	COST PER MONTH					ACCUMU-LATIVE TOTAL	COST PER TON DRY WEIGHT					ACCUMU-LATIVE TOTAL
	$FeCl_3$	LIME	LABOUR	ELEC *	MAINT**		$FeCl_3$	LIME	LABOUR	ELEC*	MAINT	
JANUARY	$379.09	$155.75	$385.00	$ 7.85	$ 5.00	$ 432.69	$3.95	$1.62	$4.01	$0.08	$0.05	$ 9.71
FEBRUARY	387.44	180.25	385.00	7.60	86.37	1979.35	4.56	2.15	4.53	0.09	1.03	12.36
MARCH	439.21	204.75	385.00	12.20	5.00	3025.51	2.78	1.28	2.42	0.08	0.03	6.59
APRIL	382.43	157.50	385.00	12.80	5.00	3968.24	2.16	0.89	2.18	0.07	0.03	5.33
MAY	409.15	162.75	385.00	9.90	5.00	4940.04	3.30	1.30	3.10	0.08	0.04	7.82
JUNE	502.67	239.75	385.00	10.10	5.00	6082.56	3.98	1.90	3.06	0.08	0.04	9.06
JULY	609.55	253.75	385.00	9.50	5.00	7345.36	4.84	2.01	3.06	0.08	0.04	10.03
AUGUST	432.53	148.75	385.00	6.60	145.70	8463.94	2.83	0.97	2.52	0.04	0.96	7.32
SEPTEMBER	429.19	143.50	385.00	6.75	5.00	7433.38	2.58	0.86	2.32	0.04	0.03	5.83
OCTOBER	424.18	166.25	385.00	7.35	137.87	10554.03	2.79	1.09	2.53	0.05	0.91	7.37
NOVEMBER	477.62	197.75	385.00	6.80	138.90	11760.10	2.91	1.20	2.35	0.04	0.85	7.35
DECEMBER	501.00	189.00	385.00	7.80	5.00	12847.90	4.65	1.75	3.57	0.07	0.05	10.09
TOTAL	5374.06	2199.75	4620.00	105.25	548.84	12847.90						
AVERAGE PER MONTH	$477.56	$183.75	$385.00	$ 8.77	$ 45.73	$ 1070.41	$3.44	$1.42	$2.97	$0.07	$0.33	$ 8.23

* ESTIMATED
** $5.00 PER MONTH ESTIMATED FOR LUBRICANTS, ETC.

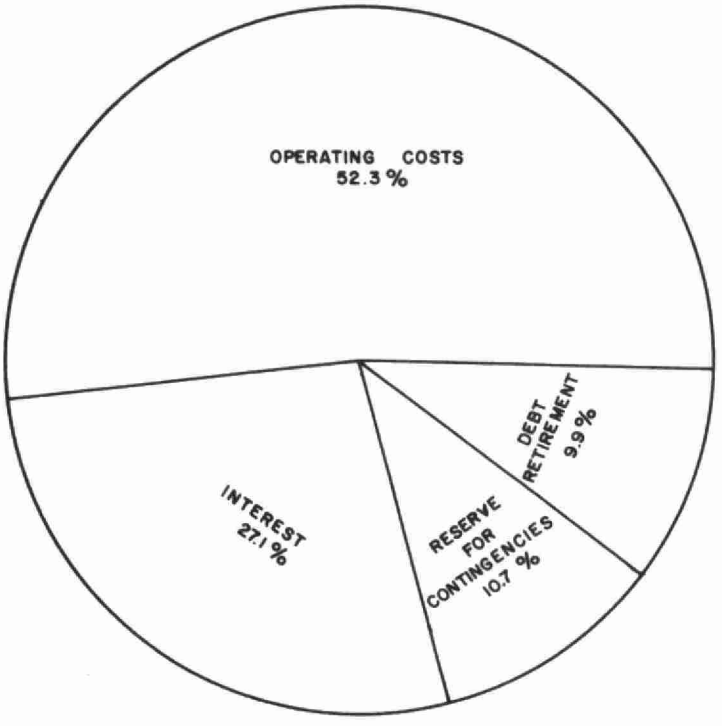
COMMENTS

The average cost of filtering sludge for 1963 was $8.23 per ton dry weight, including chemicals, labour, power and maintenance and repair of the filters.

1963 OPERATING COSTS



TOTAL ANNUAL COSTS



SUMMARY

The flow to the Sault Ste. Marie Sewage Treatment Plant during 1963 averaged 4.83 million (Imperial) gallons per day (MGD) as compared to 5.22 MGD in 1962. The 1963 flow exceeded the plant design flow of 8.0 MGD approximately 5% of the time as compared to flows exceeding 8.0 MGD 9% in 1962. The large flows were experienced in the spring of the year and may be directly attributed to spring thaws and runoff.

The strength of the influent sewage during 1963 was consistent with that of average domestic sewage, having an average BOD of 113 ppm and average suspended solids content of 163 PPM. The plant efficiency, as measured by removal of BOD and suspended solids, greatly exceeded the design expectations of a primary treatment process achieving 56% removal of BOD and 73% removal of suspended solids. The influent sewage analysis toward the end of 1963 showed higher BOD and suspended solids content than normal but enough results were not available as of January 1st, 1964 to indicate a trend. This will be investigated during 1964.

The cost of operation during 1963 was $107,538.08 representing a per capita cost to those persons using the system of $1.73, or a cost of $61.00 per million gallons of sewage treated. This compares favourably with the costs incurred at other such plants in the province.

RECOMMENDATIONS

During 1963, two major modifications were performed. These were the changing of valves at Clark Creek pumping station to permit more reliable operation and the construction of an enclosure for the sludge loading bay at the plant. This enclosure eliminated freezing of the sludge in the truck loading hopper, and greatly improved sludge handling.

In 1964, it is proposed to modify the scum draw-off piping from the primary clarifiers. In the past, there has been considerable difficulty experienced in keeping these lines from clogging. Several remedies have been attempted, including mechanical pull throughs and heating elements, but these have not proved practical. If the clogging persists new, larger diameter pipes may be required. This proposal is presently under investigation.

Total 1963 Costs

The total cost to the Townships of Korah and Tarentorus and the City of Sault Ste. Marie was as follows:

Operating	$ 107,538.08
Debt Retirement	$ 22,057.00
Reserve	$ 23,983.00
Interest	$ 82,907.04
TOTAL	$ 236,485.12

Note: The amount in the reserve account as of December 31st, 1963 was $41,520.05.

On the basis of the population being 63,200, the total annual cost of the sewage project was approximately $3.80 per person.

Division of Plant Operations

ONTARIO WATER RESOURCES COMMISSION
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